DOCUMENT RESUME

ED 158 858 PS 009 561

AUTHOR Crowell, Doris
TITLE The Use of Minimum Objectives in Curriculum Research and Development, 1975-1976. Technical Report #45.
INSTITUTION Kamehameha Schools, Honolulu, Hawaii. Kamehameha Early Education Project.
SPONS AGENCY California Univ., Los Angeles. Mental Retardation Research Center.; Hawaii State Dept. of Education, Honolulu.
PUB DATE [76]
NOTE 15p.; For related documents, see PS 009 533-560 and PS 009 562-573

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS *Curriculum Development; *Demonstration Programs; Early Childhood Education; Educational Improvement; *Elementary School Curriculum; Hawaiians; *Objectives; *Performance Criteria; Student Evaluation
IDENTIFIERS Hawaii; *Kamehameha Early Education Program

ABSTRACT

This report describes a curriculum, based on stated performance objectives, which was developed and implemented by the Kamehameha Early Education Program (KEEP). The structure of the mathematics and reading curriculum is described briefly and the use of performance objectives in evaluating student progress is discussed. Advantages of the curriculum for teachers, for students, and for program development, evaluation, and research are also discussed briefly. (JMB)

**********
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
**********

- ED158858

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Technical Reports

of

The Kamehameha Early Education Program

a research and development program established and funded by

The Kamehameha Schools/Bernice P. Bishop Estate

Ronald Gallimore, Roland G. Tharp & Gisela E. Speidel,
General Editors

Ellen Antill
Production Editor

Technical Report #45

The cooperation of the State of Hawaii Department of Education is gratefully acknowledged, as is the support and resources made available by the Sociobehavioral Research Group, MRRC, University of California, Los Angeles.

PS 009561

The opinions expressed herein do not necessarily reflect the position, policy or have the endorsement of The Kamehameha Schools/Bernice P. Bishop Estate, or of the editors.

Published by The Kamehameha Early Education Project, 1850 Makuakane Street, Honolulu, HI 96817

All rights reserved. No parts of this report may be reproduced in any form or by any means without the prior written permission of The Kamehameha Schools/Bernice P. Bishop Estate.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Kim C. M. Sloat
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

## The Kamehameha Early Education Program

The Kamehameha Early Education Program (KEEP) is a research and development program of The Kamehameha Schools/Bernice P. Bishop Estate. The mission of KEEP is the development, demonstration, and dissemination of methods for improving the education of Hawaiian and Part-Hawaiian children. These activities are conducted at the Ka Na'i Pono Research and Demonstration School, and in public classrooms in cooperation with the State Department of Education. KEEP projects and activities involve many aspects of the educational process, including teacher training, curriculum development, and child motivation, language, and cognition. More detailed descriptions of KEEP's history and operations are presented in Technical Reports #1-4.

## Abstract

This report describes curriculum development based on a system of stated performance objectives. Periodic evaluation using criterion-referenced tests keep the teacher apprised of the progress of each child in a class and identifies those children in need of special help. These results facilitate research and provide regular guidance for further program development so that curricula can be increasingly responsive to the needs of each group of children.

Technical Report #45

# The Use of Minimum Objectives in Curriculum Research and Development, 1975-1976

Doris Crowell*

When KEEP began, the Hawaii State Department of Education (DOE) had recently begun an extensive program of curriculum development and innovation, especially in language arts. Installation of the DOE's own Hawaii English Program (HEP) was well under way in many Island schools. HEP, a curriculum designed especially for Hawaii schools, has been monitored continuously since inception. With the HEP program ultimately to be made available statewide and complete freedom at KEEP to select from all other curricula, the development for KEEP's use of another, original curriculum package seemed unnecessary. Consequently, during the initial years, KEEP used standard and well-known commercial curriculum packages (e.g. Addison-Wesley mathematics program), supplemented from a variety of sources. KEEP resources instead were focused on increasing teacher effectiveness in the use of a wide variety of materials and techniques, for example, extensive efforts to train teachers to use positive approaches in classroom management (see Technical Report #7).

In successive years, however, it became apparent that no existing reading curriculum was adequate for the task of teaching KEEP children to read at grade level. Although some gains were made as the result of other efforts, it was concluded by KEEP researchers that curriculum research and development would have to be added to the KEEP operation. Thus, during the fourth year

* Sherlyn Chun's assistance is gratefully acknowledged.

(1975-1976) of classroom operations at KEEP, a program of curriculum research and development was begun with initial emphasis on mathematics and reading. To be consistent with KEEP's research efforts, these two packages should reflect developmental theory. Secondly, they should be explicitly stated, replicable and measurable.

The experiences to date and the structures and processes of the curricula based on a performance objective system are described in the remainder of this report. Since KEEP's experiences with these curricula can be counted in months rather than years, the emphasis here is more on description and plans than on results.

Structure

Discrete objectives stated in behavioral or performance terms provide the underlying structure for each subject area. The performance objective as a structural unit is comparable to that used by the Hinesberg, Vermont Reading Curriculum (1975). The objectives prepared by the KEEP staff represent the minimum level of achievement that is required if a child is to perform at grade level on standardized tests of reading and math achievement. These are called "Minimum Objectives" (M.O.s), and were either written by KEEP staff or borrowed from published sources. (See Technical Reports #43 and #44 for reports on KEEP reading and mathematics curricula).

A curriculum consists of a number of parallel strands of related concepts. Each strand includes objectives that are sequenced from easy to difficult, or from most frequently used to least frequently used, as in the case of vocabulary and syntactic structures. This organization assumes a relatively equal-interval scale of objectives in which each objective is built on the previous one, and successive tasks continue to integrate the skills that were learned earlier, thus achieving a "spiral curriculum" as described by Bruner (1966).

This type of curriculum also assumes a unidimensional, Guttman scale or a series of parallel Guttman scales represented by each strand. Ideally, knowing a child's score on any one of the strands within the curriculum tells exactly how he responded on every objective of that strand.

For each M.O., there are one or more "enablers." An enabler lists materials and a method or activity that can be used to teach the objective. A teacher is free to select or provide additional enablers that will accommodate the variety of learning styles within her classroom as long as these techniques assist a child to meet a particular objective. Enablers may be obtained from any available teaching manuals or curriculum packages and incorporated into the M.O. system. In a well-sequenced system of M.O.s, early objectives are internalized into the child's academic behavior, and later may become enablers to assist him in acquiring new, more complex skills.

The sequences of M.O.s for each curriculum are arbitrarily divided into nine data point periods of approximately 20 days each. Each data point period contains a specific number of objectives to be met within that four week period.

Evaluation

At the end of each data point period, the children are administered criterion-referenced tests to determine whether or not they have met each of the minimum objectives for that period. Additional evaluation using tests from the total pool of M.O. tests may be prescribed by the teacher to verify the level at which each child is performing. The tests also determine the child's strengths and weaknesses, and provide a profile of his abilities in that subject area.

Since the data point testing is cumulative in that it gives increasing amounts of information about each child along the various strands within

each content area, it also measures how effectively the curriculum is meeting the needs of KEEP children. Especially high or low scores in one area by most children may suggest inappropriate placement of objectives within the scope and sequence of the particular curriculum package. Since there is little empirical evidence on what tasks are necessary components of reading acquisition, objectives that relate to these tasks may be inappropriate or irrelevant. Low scores may also suggest inappropriate enablers; or they may identify a developmental or cognitive disability or a cultural difference prevalent among the group of children receiving the instruction.

The feedback from apparently too difficult items suggests a need for smaller, more detailed steps in the presentation of such material or a need to use enablers that will permit the children to use different input modalities in acquiring the objectives. In either case, the evaluation procedures, which are integral to the whole curriculum, provide feedback regarding each child's progress.

Reporting is accomplished at several levels. A graph for each child shows how many objectives he has met at each data point period. The overall curve shows his progress throughout the school year (see Fegure 1).

Results for all children within each grade are reduced to a single table that states which M.O.s each child has passed and those he has tried but not completed successfully. This breakdown permits diagnostic analysis and perscriptive programming on an individual basis (see Figure 2).

Graphic presentation of all four grades includes the proportion of children who are functioning above, at, or below data point level within each grade (see Figure 3).

The results of the M.O. tests that are reported each data point period constitute an "early warning system" that alerts the teacher to children who

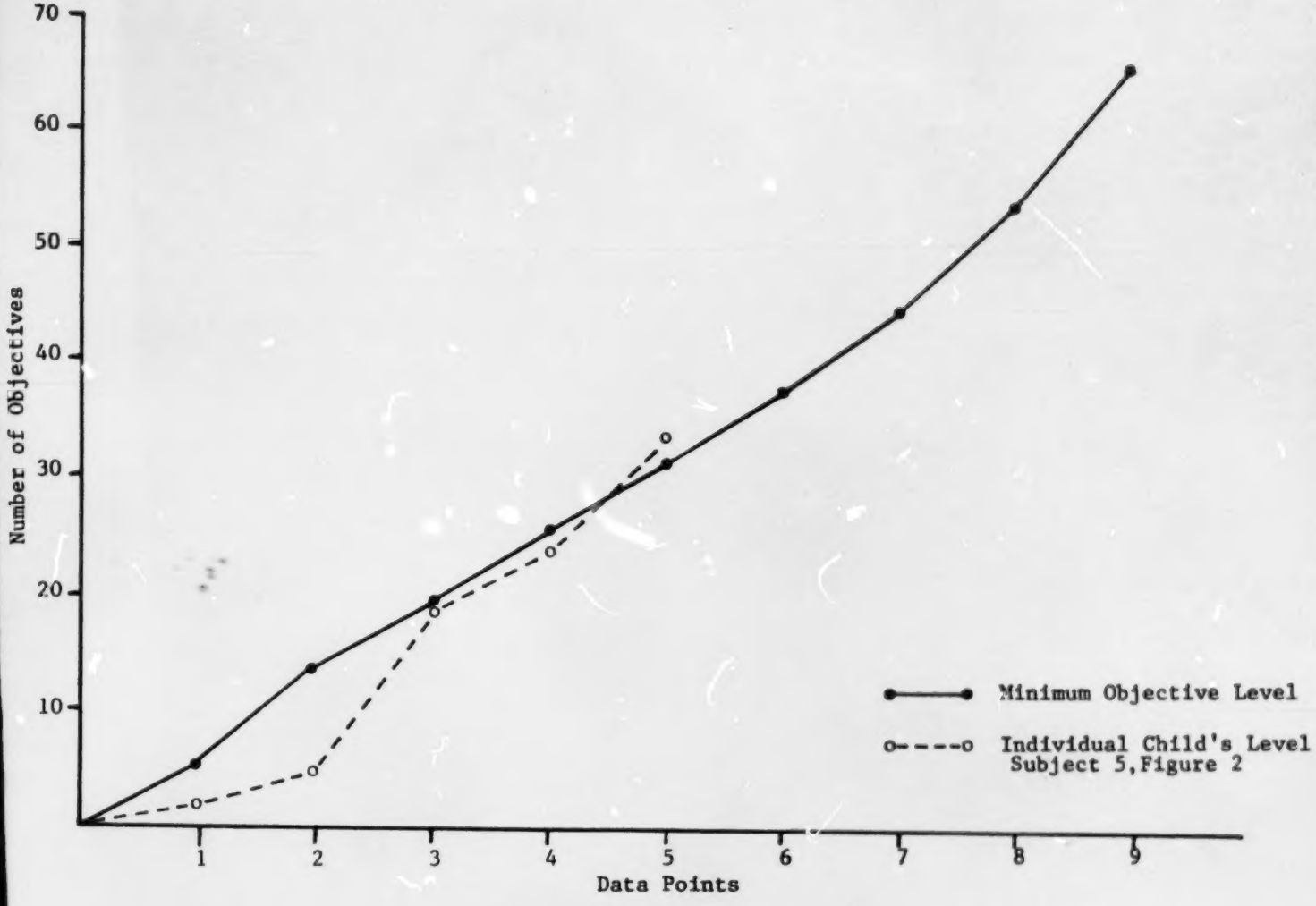


Figure 1

Individual child's graph showing rate of progress through nine data point periods

Grade 1, Math, DP2

| | 2.1 | 2.2 | 2.4 | 2.5 | 2.6 | 2.7 | 3.1 | 3.2 | 3.4 |
|---|---|---|---|---|---|---|---|---|---|
| Subject 1 | P | P | P | P | P | P | P | P | P |
| Subject 2 | P | P | P | P | P | P | P | P | P |
| Subject 3 | P | P | P | P | P | P | P | P | P |
| Subject 4 | P | P | P | P | P | P | P | P | P |
| Subject 5 | F P* | F P* | F P* | F P* | F P* | F P* | P | P | F |
| Subject 6** | F | F | F | F | F | P | | | |
| Subject 7 | P | P | P | P | P | P | P | P | P |

* Retested by Tutors

** Subject was not given test beyond the second data point.

Figure 2

Class results for each MO tested for one data point period

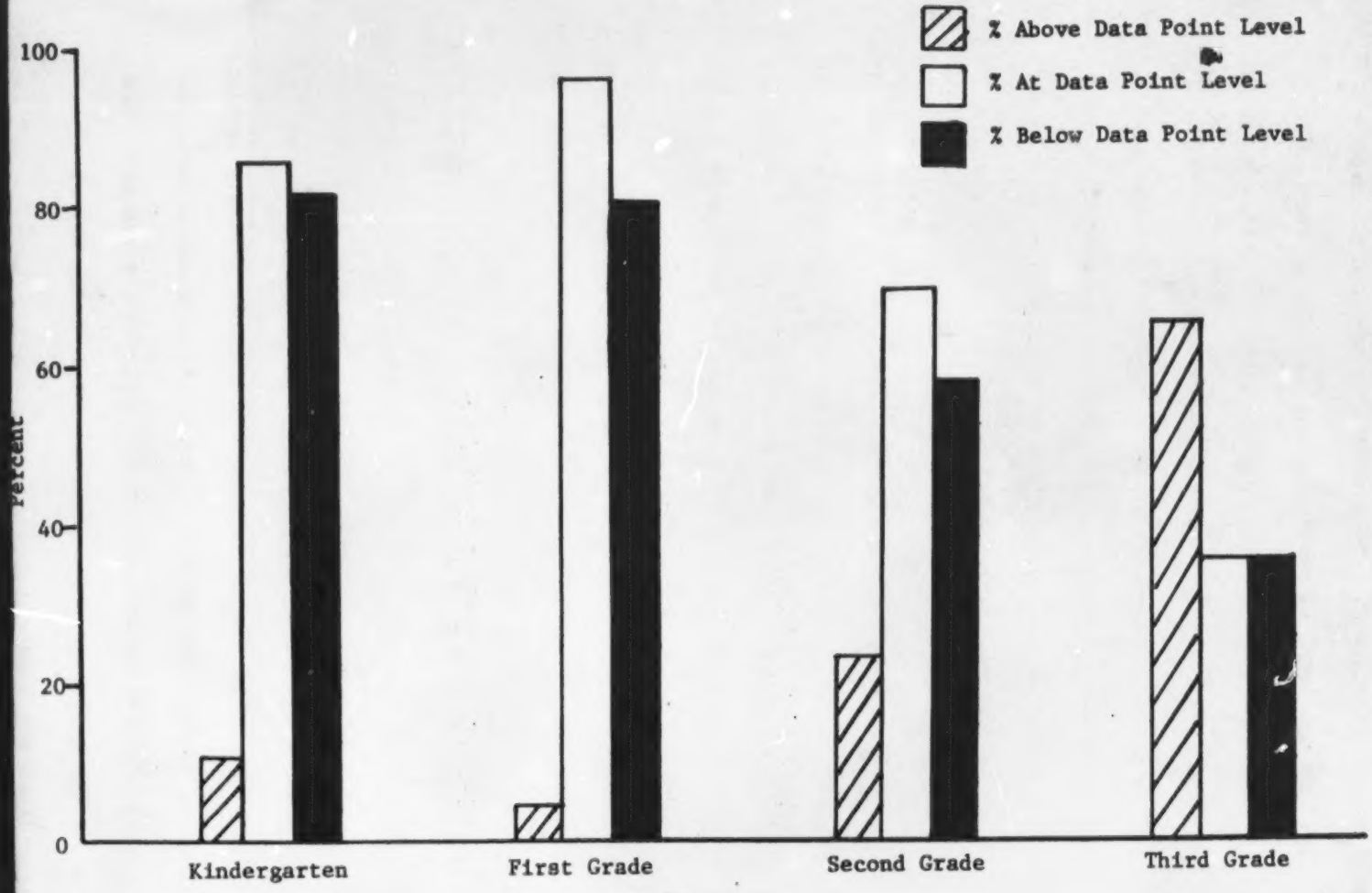


Figure 3

Percent of children at, above, and below Data Point level in math in each grade

are not making satisfactory progress. These target children are identified as soon as their performance level is determined, or as soon as they fall behind and their particular deficits are specified. Remedial measures can be undertaken immediately so that these deficits do not become cumulative.

The results also provide a realistic, informed basis for individualized programming for smaller groups of children. If a few children reveal a deficit in a specific skill or content area, instruction and practice can be arranged for these children at their appropriate academic level and prepare them to succeed at the next higher level.

In the same way, children who are ahead of the class can proceed at their own rate through the sequence of objectives. The teacher is assured that each step is being covered, and can guide the children in selecting additional activities that will broaden their understanding and enrich their experience.

Advantages

The M.O. system provides for the teacher in many ways. It makes planning easy, specifies the objectives to be taught, and the order in which these objectives should be presented. This standardization of content allows for maximum flexibility in presentation. Teachers are able to exchange duties comfortably since they can convey easily where each child is in the curriculum. Substitute teachers can take over a class with minimum confusion, and teachers in succeeding years know exactly what material has been covered.

In spite of the standardization of content, there is, at present, complete flexibility in teaching style. The teacher is free to choose any enabler she wishes, use any method or technique so long as the objective is reached. She may shift from one method to another to accomodate the learning styles of different children within the class.

The results of the M.O. testing provide guidance for improving or revising

the curriculum so that it becomes increasingly appropriate for KEEP children and similar populations; thus continuous curriculum refinement and development are stimulated.

An additional advantage to teachers is the regular, periodic feedback regarding success in helping the children to meet the M.O.s.

In addition to the benefits to individual children and the guidance provided to the teacher, the use of a M.O. system stimulates and facilitates program development, evaluation, and research. The built-in procedures of student evaluation and reporting provide objective, quantitative data that can be grouped, compared, and manipulated. These data help to describe the sample of children enrolled at KEEP and to identify their strengths and weaknesses. The ability to reduce and analyze the data produced makes the comparison of many aspects of the instructional process possible, and guides revision of the curricula to make them increasingly appropriate for KEEP children. The emerging products and research findings based on them are useful in-house, but, more important, they are generalizable to similar populations. The procedures are appropriate for schools where substantial numbers of comparable children attend.

At present, the KEEP reading and mathematics curricula are in usable, experimental draft form. They are being tested in the classrooms and continuously revised. Each revision makes the curricula more internally consistent and closer to meeting the assumptions of unidimensional and equal-interval scaling.

Several major revisions and additions are being considered at this time. First, in the reading curriculum, an expanded comprehension strand is being prepared to increase the emphasis on comprehension, use of contextual cues, and abstracting or summarizing meaning from reading materials. KEEP children have

difficulty in this area (see Technical Reports #23, #26, #40, #50, and #53), indicating a need for more careful programming of learning experiences in this area.

Both results of standardized tests used for research purposes and the classroom performance of children suggest relatively poor ability in functional oral language and a paucity of strategies for verbal or symbolic problem-solving (see Technical Reports #36, #37, and #50). KEEP children appear to have had limited experience in cognitive operations and do not know how to respond to tasks which require discrimination and generalization (see Technical Reports #31 and #37). Curriculum strands in both oral language and cognitive operations are being planned, especially for kindergarten and first grade levels, primarily in the reading curriculum, but to be coordinated between reading and mathematics.

The M.O. structure continues to be a useful framework for developing curriculum packages in various content areas and is sufficiently flexible so that each curriculum can be dynamic and adaptable in meeting children's needs. Such a curriculum will never be finished in the sense that no more changes will be undertaken. Additions will always be possible to make the content and methods increasingly responsive to the developmental demands of the children involved.

To adopt and use a M.O. system successfully teachers must make a strong commitment to the process. Using the information provided by the feedback loop requires continuous self-evaluation and a problem-solving approach in monitoring one's teaching behavior. In addition, selecting objectives for individual or small groups of children in terms of their progress demands a high level of personal involvement. Such a system demands the support and cooperation of all of the teachers and administrators involved to realize the maximum benefit for teachers and children.

## References

Bruner, J. S. Toward a Theory of Instruction, W. W. Norton & Co., Inc., New York: 1966.

Revised Reading Objectives. Hinesburg Elementary School, Vermont: 1975.